

## PATENT CLAIMS:

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Fig

5      1. Method for the thermal treatment of at least one layer, preferably comprising compound semiconductors, for the activation of foreign atoms passivated in the layer by hydrogen, having the method steps:

10      heating at least one layer, for a first time interval of less than 120 sec, to a temperature greater than a first temperature at which the specific sheet resistance decreases,

15      within the first time interval, heating at least one layer, for a second time interval of up to 60 sec to a second temperature greater than the first temperature,

20      whereby during the method, in at least one third time interval, producing charge carriers are by electromagnetic radiation within said layer.

2. Method according to claim 1, characterized in that the first temperature is between 300 C and 1200 C.

3. Method according to claim 1 or 2, characterized in that the second temperature is between 600 C and 1200 C.
4. Method according to claim 1 to 3, characterized in that thermal method steps that are beyond the first time interval are provided at temperatures  $T$  less than  $T_1$ .
5. Method according to one of the claims 1 to 4, characterized in that the third time interval is partially beyond the first time interval.
6. Method according to one of the previous claims, characterized in that the third time interval is equal to the first.
7. Method according to one of the claims 1 to 5, characterized in that the third time interval is beyond the first time interval.
8. Method according to one of the claims 1 to 5, characterized in that the third time interval encompasses the second time interval.

9. Method according to one of the claims 1 to 5, characterized in that the charge carriers are formed by electromagnetic radiation prior to the second time interval in terms of time.
- 5 10. Method according to one of the claims 1 to 5, characterized in that the charge carriers are formed by electromagnetic radiation prior to and during the second time interval in terms of time.
- 10 11. Method according to one of the claims 1 to 5, characterized in that the charge carriers are formed by electromagnetic radiation during and after the second time interval.
- 15 12. Method according to one of the claims 1 to 5, characterized in that the charge carriers are formed by electromagnetic radiation after the second time interval.
- 20 13. Method according to one of the claims 1 to 5, characterized in that the charge carriers are formed by electromagnetic radiation only prior to and after the second time interval.
14. Method according to one of the claims 1 to 5, characterized in that the charge carriers are formed by electromagnetic radiation within the second time interval.

15. Method according to one of the claims 1 to 14, characterized in that at least one layer includes compound semiconductors of the group III-V.

16. Method according to one of the claims 1 to 15, characterized in that at least one layer includes compound semiconductors of the group II-VI.

17. Method according to claim 16, characterized in that at least one layer includes compound semiconductors of the group III nitrides.

18. Method according to at least one of the preceding claims, characterized in that the energy of the electromagnetic radiation is greater than the energy gap of at least one layer.

19. Method according to at least one of the preceding claims, characterized in that the thermal treatment of the layer is effected within an RTP system.